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ABSTRACT

The Classroom Attitude Observation Schedule was developed and field tested for study of independent child behavior in the open classroom. Eight Head Start classrooms were used for field testing, six of which used the Tucson Early Education Model curriculum and two of which, for comparison, used local curricula. Procedures involved observing and recording into mutually exclusive activity categories the location of children and adults at two-minute intervals over a thirty-six minute free-choice period. Incidents of inappropriate behavior were also recorded. During the middle twelve minutes, all adults except the observer left the classroom. The procedure demonstrated sensitivity to changes in child behavior during teacher absence. Comparison classrooms had significantly more incidents of inappropriate behavior during teacher absence than during teacher presence. TEEM classrooms maintained a stable pattern of behavior throughout the observation period. The system was concluded to be extremely useful in assessment of independent learning behavior of children in large groups and should transfer easily to other open classroom settings. (Author/KM)

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AN INVESTIGATION OF INDEPENDENT CHILD BEHAVIOR IN THE OPEN CLASSROOM: THE CLASSROOM ATTITUDE OBSERVATION SCHEDULE (CAOS)

By: Ocea Goldupp

Presented at
Second Annual Follow Through
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ABSTRACT

Procedures were developed and field tested for study of independent child behavior in the open classroom. Procedures involved observing and recording into mutually exclusive activity categories, the location of children and adults at two minute intervals over a thirty-six minute period. Incidents of inappropriate behavior were also recorded. Recording took place during a free-choice period. During the middle twelve minutes all adults, except the observer, left the classroom.

Eight Head Start classrooms were used for field testing the system. Six of the classrooms used the Tucson Early Education Model (TEEM) curriculum and two used local curricula for comparison. The procedure demonstrated sensitivity to changes in child behavior during teacher absence. The variable demonstrating statistically significant changes was that of inappropriate behavior. Comparison classrooms had significantly more incidents of inappropriate behavior during teacher absence than during teacher presence. TEEM classrooms maintained a stable pattern of behavior throughout the observation period.

The system was concluded to be extremely useful in assessment of independent learning behavior of children in large groups and should transfer easily to other open classroom settings.

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this study was to develop an observation instrument and technique for assessing independent child behavior in an open classroom. The study was limited to a description of the development of the system and to a field test of its sensitivity to shifts in behavior patterns of children when they were operating independently.

Background

The study was undertaken as part of a Head Start evaluation study by the Evaluation Component of the Follow Through program of the Arizona Center for Educational Research and Development. The Office of Child Development funded the Planned Variation Study of Head Start. This was a study patterned after the national Follow Through program, in which classroom curricula were deliberately varied throughout the country in order to evaluate differences in program effects. The Tucson Early Education Model (TEEM), sponsored by the Arizona Center, was one of eight curriculum models selected for inclusion in the Planned Variation Study.

Stanford Research Institute in Menlo Park, California, has held major responsibility for evaluation efforts of Follow Through projects throughout the country and of the Head Start Planned Variation projects in which Follow Through curriculum models were used. However, the Office of Child Development also supported small studies specific to particular

curriculum sponsors which were conducted by the sponsors themselves. This study, then, was part of the study specific to the TEEM.

The four goals of the TEEM study were:

1. To develop an observation-evaluation system to test selected process goals of the TEEM.
2. To develop a unique set of tasks to assess children's development in Head Start classrooms using the TEEM.
3. To field test this battery in a small study with six TEEM classrooms and two locally implemented comparison classrooms.
4. To perform statistical analyses of potential non-directional differences between these classrooms (Rentfrow, Durning, Conrad and Goldupp, 1972).

This study was directed to the first of these four evaluation goals, the development of an observational-evaluation system to test selected process goals of the TEEM. These TEEM goals are development of language competence, an intellectual base, a motivational base, and societal arts and skills. The area of interest in this study was limited to the third goal, motivational base. That goal is defined as a collection of attitudes and behavioral characteristics related to productive social involvement. These include positive attitudes toward school and toward the learning process, an appreciation for learning and a willingness to persist at learning tasks, and an expectation of success and a willingness to change (Arizona Center for Early Childhood Education, 1971).

For purposes of this study the motivational base was operationally defined as the extent to which children ntinue school related

tasks in a socially acceptable manner, without pressure or presence of controlling adults.

The motivational base is integral to the whole open education movement. Walberg and Thomas (1972) make a concerted effort to more clearly define open education and state that "implicit in the approach is a view of the child, especially in the primary grades, as a significant decision-maker in determining the direction, scope, means and pace of his education (p. 198)."

After discussing and identifying themes consistent in the open education movement, they state in their conclusion:

> The concept has been the subject of very little evaluation and research, aside from testimonials by proponents. Before it is expanded from the limited number of extant experimental settings in this country, administrators, teachers and parents quite properly should know if it leads to more learning, to higher levels of performance in reading, to greater self-esteem and self-determination, to the good life. We have developed some exploratory instruments that are indicative of presumably important aspects of open classroom processes. Seeing if these processes are related to valued educational outcomes is an obvious next step for those who wish to evaluate Open Education (Walberg and Thomas, 1972, p. 207).

Maccoby and Zellner (1970), in their overview of Follow Through projects, discuss varying points of view regarding motivation and independence. While reinforcement theorists see development of independence as a stretching out of a reinforcement schedule, the open educators believe that reinforcement should come from the materials the child is working with and from the pleasure that comes from success. Maccoby and Zellner go on to state:

> To our knowledge, evaluation procedures comparing the effectiveness of the various programs have not attempted to assess how self-sustained the children's learning actually is. It would be possible to watch to see what happens when

> the teacher goes out of the classroom--whether the children find something to work on, or whether they sit passively or engage in horseplay. This has not yet been done in any systematic way (Maccoby & Zellner, 1970, p. 75).

A review of the literature produced virtually nothing in terms of assessment of independent behavior in children. It appeared that most efforts in this direction have been limited to paper and pencil tests, questionnaires, or projective techniques. Examples of projective techniques for this purpose may be found in studies by Battle and Rotter (1963), and Riedel and Milgram (1970).

A major exception to this deficit is a series of studies by White and Lippitt (1960). Their approach to evaluation of independent behavior takes quite another direction. White and Lippitt formed small, informal boys' clubs and arranged situations in which the leadership style was varied. They set up several "test situations." One of the situations involved removing the leader during meetings either by arranging his late arrival or his departure for brief periods during the meeting. The leadership styles involved were labeled "democratic," "autocratic," and "laissez-faire." All clubs were subjected to at least the democratic and autocratic leaders, whose roles were carefully defined by the investigators.

Observers were present during all of the situation variations, and no attempt was made to conceal observers from the boys. White and Lippitt believed that they had ample evidence that the observers were completely or almost completely ignored by the boys.

The observers made anecdotal records of everything said by the five boys in a club and wrote a running account of all significant occurrences. Conversation recorded was later subjected to sentence by sentence

content analysis and interpreted in terms of social implications. "The analysis was in terms of categories such as 'aggression in democracy,' 'aggression in autocracy,' 'friendly,' 'work-minded,'...[White & Lippitt, 1960]." Among results of analyses made, it was found that in the autocratic setting boys were more hostile and aggressive. They also demonstrated more dependence and less individuality.

While White and Lippitt's studies dealt with only small groups, they believed that experiments at this level could bring insights to advantages and disadvantages of democratic organization (White & Lippitt, 1960).

A means for similar assessment in terms of the whole classroom setting appears to be called for today. While the open classroom proponent might espouse many of the same goals and use many of the same "controlling" techniques as those used by the democratic leader of White and Lippitt's studies, the increase in size of group and area would make the observation of such a setting difficult if an observer were called upon to observe and record everything. The difficulties of evaluation in the open classroom seem inherent in the setting described in the recent Newsweek article (1971). They informally describe the open classroom atmosphere "as much like that in a newspaper city room, where conversations, ringing telephones and chattering typewriters produce a constant cacophany. The noises are a distraction only to those who are not used to them [p. 62]." This atmosphere is later in the article referred to as "controlled chaos."

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While the type of observation technique used by White and LIppitt (1960) does not seem practical in the total classroom environment, some

sort of observation technique does seem appropriate. Observation, as described by Wright (1960), is a method that allows the study of spontaneous and ongoing child behavior in the settings of everyday life. Such methods clearly seem called for in the open-informal environment in which no single specifiable outcome can be described for every child.

White and Lippitt's test situation of leader absence also seems appropriate to the classroom setting. Grimmett (1970) wrote a position paper in which she presented a compelling case for use of situational tests (i.e., a standardized natural situation to which children respond behaviorally). She quotes (p. 8) from the Subcommittee on Compensatory Education in which they resolved that "learning performance, attitudes, curiosity, etc., will not be thought of as characteristics which the child possesses independently of the setting in which they are manifested." Among the advantages of test situations presented by Grimmett are that they call for demonstration of the required response, diminution of dependency on verbal behavior, and simulation of reality contexts.

The Classroom Attitude Observation Schedule (CAOS), developed for the present study, combines observation with situational evaluation. The schedule specifically directs itself to measuring the self-direction and independence of the learner. The classroom situation in which CAOS is used is one that calls for independent behavior on the part of children in the classroom in the face of an adult-free situation.

Two major sources were referred to for information on development of appropriate observation techniques: Medley and Mitzel's chapter on "Measuring Classroom Behavior by Systematic Observation" found in the Handbook of Research on Teaching (1963), and Wright's chapter on

"Observational Child Study" found in the Handbook of Research Methods in Child Development (1960). Following are some of the major criteria discussed in both of these sources.

1. The observer should only be asked to classify some kind of unit of behavior, rather than make judgments based on many individual behaviors (Medley and Mitzel, 1963, p. 250).
2. The observer should record relevant aspects of classroom behavior as they occur (or within a negligible time limit after), with a minimum of quantification intervening between the observation and the recording of it (Medley and Mitzel, 1963, p. 250).
3. The behavior to be observed must be divided into observable lengths (Wright, 1960, p. 73).
4. Two approaches to contruction of items were suggested.
   a. A category system which determines a convenient unit of behavior and constructs a finite set of categories into one and only one of which every unit observed can be classified. This record shows for each period of observation the total number of units of behavior which occurred and the number classifiable in each category (Medley and Mitzel, 1963, p. 298).
   b. A sign system which lists beforehand a number of specific acts or incidents of behavior which may or may not occur during an observation period. The record will show which of these incidents occurred during a period of observation and, in some cases, how frequently each occurred (Medley and Mitzel, 1963, p. 298).

CHAPTER II

DEVELOPMENT AND METHODOLOGY OF THE CLASSROOM ATTITUDE OBSERVATION SCHEDULE (CAOS)

Development Background

The Classroom Attitude Observation Schedule (CAOS) has been developed using both a category and a sign system. The basic framework and category scheme were taken from the Classroom Observation Procedure (COP) developed for national Head Start evaluation by Stanford Research Institute (SRI, 1971). Dr. Jane Stallings, developer of the SRI procedure, granted permission to make use of their instruments and was consulted regarding the planned adaptation of the SRI procedure. SRI's procedure actually encompasses several individual procedures. The two major procedures are the Classroom Check List (CCL) or "snapshot," and the Five Minute Observation (FMO). Generally, their system involves completing the CCL once, just prior to the FMO. The CCL consists of seventeen mutually exclusive categories into which all teacher and child activities may fall. A clockwise visual scan of the room is made by an observer. During the scan the observer records the appropriate location for every child and adult. This followed by the FMO, which is a system of recording human interaction. Both are completed four times each hour during the school day. The portion of this system borrowed for CAOS was the "snapshot" category set, and the recording method involving the clockwise visual scan. The CAOS includes one addition, "wandering," to the activity category system. The activity categories used in CAOS are:

Snack, lunch

Group time

Story, singing, dancing, music

Arithmetic, math, numbers

Reading, alphabet, language development

Social studies, geography

Science, natural world

Games, puzzles

Arts, crafts

Sewing, cooking, pounding, sawing

Blocks, trucks

Dolls, dress up, playhouse

Play

Transitional activities

Classroom management

Out of room

Observing, other

Wandering

The definitions of these categories are essentially the same for CAOS as they are for SRI's system. They have, however, been somewhat redefined to make them more program specific to the Tucson Early Education Model and to deal more appropriately with pursuits of four and five year old children. Figure 1 demonstrates one such redefinition. For a complete set of definitions for CAOS, see Appendix A.

SRI Version	CAOS Version
"This category refers to the teaching and learning about plants, animals, minerals (care of, collection, comparison) and science concepts. It is subdivided into texts, workbooks; plants, animals; science equipment; and films, slides as tools for teaching and learning in this area. All of these have been defined except for science equipment, which refers to any apparatus or concrete objects used in the course of teaching and learning about science and the natural world."	This category refers to teaching and learning about plants, animals, minerals (care of, collection, comparison) and science concepts. With very young children this may consist of: playing with a classroom animal, such as a rabbit or gerbil looking at fish in a tank looking at objects through a microscope. Included in the science conepts would be the intellectual skills taught through a variety of means. This would include "Intellectual Kits" which are used for fostering observational skills, and for making comparisons, among other things. This will also include activities dealing with shapes and the discrimination skills associated.

Figure 1. Comparison of SRI and CAOS Definitions for One Activity Category: "Science, Natural World"

Source
SRI Version: Stanford Research Institute, 1971
CAOS Version: Current study

The sign system, combined with the above category system, is a set of inappropriate behaviors which are recorded only if they are observed. The inappropriate behaviors are:

Hitting (h)

Yelling (y)

Interfering (If)

Leaving room without permission (lr)

Throwing (th)

Other (*)

Most of the inappropriate behaviors were taken from the categories used by Grimmett, Underwood, and Brackney (1970) for an instrument developed at the Arizona Center, the Schedule for Incompatible Learning Behavior (SILB). The SILB researchers developed their categories in consultation with classroom teachers in order to arrive at behaviors that were commonly acknowledged as disturbing. The first four listed above were taken directly from the SILB. CAOS added to this the categories of "throwing" and "other" in lieu of a SILB category called "disturbing." If the CAOS observer sees a behavior that is clearly disruptive, he may record it and note the behavior at the bottom of the recording form for a firm decision about its use at a later time. A category called "ignoring" from the SILB was also not used. Teacher direction, subject to ignoring behavior on the part of children, is not a concern of the open classroom environment, nor is it clear that such behavior is disruptive.

Methodology of the CAOS

The CAOS has been designed to detect pattern shifts in a classroom during the absence of a teacher and all other controlling adults.

In order to establish patterns, a period of twelve minutes is spent by the observer recording activities of adults and children (Phase A); twelve minutes recording activities of children during absence of adults (with the exception of the observer) (Phase B); twelve minutes again recording both adult and child activities, with adults reinstated in the room (Phase C). The total observation period consists of thirty-six minutes, as illustrated in Figure 2.

A	B	C
12 min.	12 min.	12 min.
Adults present	Adults absent	Adults reinstated
. . . . .	. . . . .	. . . . .

Figure 2. Phases of CAOS

Once every two minutes a clockwise visual scan is made of the room by the observer. In the course of each scan the observer counts and records the location of children and adults in the appropriate row and column of the CAOS Recording Form (Figure 3).

The recording form consists of a row for each activity category listed in the first column. There are six major blank columns for recording each two minute scan for a twelve minute observation phase. A completed observation of thirty-six minutes will consist of three such pages. Each of the major columns has two parts. One, labeled "N.I." is for recording number of children or adults engaged in the activity. The other, labeled "I.A." is used to record incidents of inappropriate behavior.

CLASSROOM ATTITUDE OBSERVATION SCHEDULE (CAOS)

Teacher_____ School_____ Community_____ Date_____ Observer_____ Time Started_____

page____of 3

	N.I.	I.A.	N.I.	I.A.	N.I.	I.A	N.I.	I.A.	N.I.	I.A.	N.I.	I.A.	Total
A. Snack Lunch													
B. Group time													
Story/Sing Dance/Music													
C. Arith/Math Numbers													
Reading/Alpha Lang. Devel.													
D. Soc. Studies Geography													
Science Nat. World													
E. Games Puzzles													
F. Arts Crafts													
Sew/Cook Pound/Saw													
G. Blocks Trucks													
Dolls/Dressup Playhouse													
H. Play													
I. Transitional activities													
J. Classroom management													
K. Out of room													
L. Observing Other													
M. Wandering													
Totals													

N.I. = Number Involved
I.A. = Inappropriate Activity

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Figure 3. CAOS Recording Form

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The observer will find a position in the room that fulfills two requirements. First, it must offer the best view of all activities in the room, and, second, it must not obstruct movement of children or their access to materials. Once this position is located, the observer does all recording from there, remaining stationary for the entire thirty six minute period. Every two minute scan in that room, then, begins and ends at the same point. If any attempt is made on the part of children to interact with observers, the observer is to simply say, "I can't talk now, I have work to do."

Numbers of children and adults observed during the scan are placed in the appropriate cell, while retaining grouping patterns in the recording. Teachers and helpers are recorded in the appropriate activity with a T for teacher and H for helper. If inappropriate behavior is observed during the scan, it is also noted by its associated activity and during the appropriate two-minute scan. The inappropriate behaviors are simply coded by the initials shown in the listing given earlier, with the number of children behaving inappropriately. For example, y-3 in the I.A. column would mean that three children were yelling. Two more scans are made during the two-minute period to pick up incidents of inappropraite behavior, one at the end of a minute and again at the end of a minute and a half.

Actual recording by the observer is made in the form of numbers of children observed engaging in an activity. Since the same type of activity may take place in several areas of the room, an individual cell may contain several numbers. This then will show for any two minute period how children grouped themselves as well as how many were engaged

in any type of activity. During phases A and C, the adult present phases, adults are recorded as well. Figure 4 is a small segment of a recording form in which sample entries have been made.

The recording of a two minute observation scan demonstrated by Figure 4 gives the following information about the classroom. One child is working with a helper either at a math center or anywhere in the classroom at a math or number game or related activity. A child is working with a teacher in a language related activity (possibly the teacher is taking dictation or is listening to the child read). Three children are involved in one art or crafts activity and are working with a helper. Somewhere else in the classroom two children and two helpers are working at the same arts or crafts activity. In another area three children are operating independently, but the three are engaged in the same kind of arts or crafts activity. There are several ways to view these entries for arts and crafts. One is that three small groups are engaged in arts and crafts, in three different locations in the classroom. Another is that eight children and three helpers are engaged in arts and crafts. Reading down the form to the next activity, three children are working independently at some sort of sewing, cooking, pounding, or sawing activity. One child is playing with blocks or trucks. Two children are playing but at no clearly specified activity. Combined with this activity entry, is an entry for inappropriate behavior. One of the two children playing is yelling in a disturbing manner, inappropriate to the activity. Next, one child is involved in some sort of management activity such as handing out materials, or sharpening his pencil.

Teacher Doe School

	N.I.	I.A.
A. Snack Lunch		
B. Group time		
Story/Sing Dance/Music		
C. Arith/Math Numbers	1-H	
Reading/Alpha Lang. Devel.	1-T	
D. Soc. Studies Geography		
Science Nat. World		
E. Games Puzzles		
F. Arts Crafts	3-H 3 2-HN	
Sew/Cook Pound/Saw	3	
G. Blocks Trucks	1	
Dolls/Dressup Playhouse		
H. Play	2	Y-1
I. Transitional activities		
J. Classroom management	1	
K. Out of room		
L. Observing Other		
M. Wandering		
Totals		

N.I. = Number Involved
I.A. = Inappropriate Activity

Figure 4. Sample Coding of Two Minute Scan from CAOS.

Summarizing the information recorded in this two minutes, one may see that there were nine groups functioning at one time. There were seven activities involved. All adults in the classroom were spending their time interacting with children. There was one incident of inappropriate behavior during the two minutes.

Observer Training and Reliability

The CAOS developer (this investigator) trained one other research assistant in use of CAOS during a two-week period prior to the field test. Kindergarten classrooms at Ochoa School, TEEM's demonstration school in Tucson, Arizona, were used for training.

Training consisted of a review of categories and their definitions, then practice coding by both observers in the same classroom, without the manipulative phase. After practice coding, the two observers met outside to compare coding and isolate trouble spots. When definitions were not clear, they were re-worked until both observers could agree on their meaning and observability.

Finally, arrangements were made with the two kindergarten classroom teachers to duplicate the manipulative situation. When the two observers recorded together during two thirty-six minute observations, taken on two separate days and several days apart, the observers achieved reliability with average agreement of 82%,and a high of 91%. It was felt that this was high enough to permit comparability of observations made by the observers in separate observations.

The method used for calculation of observer agreement was Scott's "pi" coefficient (Scott, 1955). Directions for use of Scott's formulae were taken from Flanders (1966) manual for interaction analysis observers.

Flanders found this a useful method because it is unaffected by low frequencies in some categories and can be used with percentage data. Frequencies are converted to percentages. Following is the basic formula:

$$\pi = \frac{P_o - P_e}{100 - P_e}$$

Observed percentage (P_o) was calculated by finding the percentage difference between observers for each category, summing the differences, and subtracting the sum from 100. Expected percentage (P_e) was calculated by finding average percentage in each category for the two observers, squaring the average, dividing by 100, and summing. This sum equals P_e (Flanders, 1966).

CHAPTER III

RESEARCH DESIGN AND FINDINGS

Sample

As in all phases of the research for the TEEM-specific Head Start evaluation, only one of the three communities using the program for Head Start Planned Variation could be included in the sample due to economic limitations. Lincoln, Nebraska, which was the community selected has eight Head Start classrooms, six using the TEEM and two locally implemented curricula (Rentfrow, Durning, Conrad and Goldupp, 1972).

The population of behavior sampled was that occurring during free choice time in all eight classrooms. This is the time when children choose their own activities from those available in the classroom (Rubow and Fillerup, 1970). The decision to standardize procedures on free choice time stemmed from a combination of reasons:

a) The behavioral setting needed to be consistent across all classrooms. Grimmett, Underwood, and Brackney (1970) found powerful evidence that the behavioral setting controls incidence of disruptive behavior, and individual choice time was associated with lower rates of inappropriate behavior than large group time.

b) The block of time during which children choose their own activities was the longest in both TEEM and locally implemented Head Start classrooms. Otherwise it would be impossible to obtain observations during a single behavior setting for a full thirty-six minute period.

c) Free choice time in the TEEM classroom carries the greatest overlap into the open classroom concept.

Observations took place the last week of Arpil, 1972, with one (thirty-six minute) observation period for each classroom during that week. Two observers (the investigator and the trained research assistant) observed in four classrooms each.

Plan for Analysis

As stated earlier, the purpose of the CAOS study was to discover pattern shifts given the absence of classroom "controlling" adults. Such shifts could take many forms. The variables described below are those that might demonstrate controls which are largely adult centered versus controls internalized by the children or imposed by the physical or behavior setting. A meaningful pattern would be one in which the variable increases or decreases during teacher absence and returns to the level exhibited during Phase A, when teacher returns in Phase C. A stable pattern, then, would be one in which all three phases look much alike. Three principal questions were being asked.

1. Are there differences between observation phases on any of the summary variables?
2. Is there a difference between TEEM and Comparison classrooms?
3. Is there interaction between classroom assignment and observation phase?

To analyze the data a two by three factorial design was used. One independent variable used was classroom assignment (TEEM and Comparison). The other independent variable was observation phase (Phases A, B, and C). Phases were treated as repeated measures on the same subjects.

This analysis was repeated using each of the five summary variables as the dependent variable.

The dependent summary variables were:

1. Mean group size
2. Mean number of children engaged in an activity
3. Inappropriate behavior
4. Mean number of groups
5. Mean number of activities

Mean group size was calculated by dividing total number of children counted in a twelve-minute phase by the number of groups counted in that phase. Mean number of children engaged in an activity at any one time during the twelve-minute phase was calculated by dividing the total number of children counted in a phase by the number of cells used in the phase. Inappropriate behavior was simply a total count of incidents of inappropraite behavior observed during the twelve-minute phase. Mean number of groups was calculated by dividing number of groups counted in a phase by number of two-minute scans in the phase. (In all but two instances, there were six scans for every phase.) Mean number of activities was calculated by dividing number of activity cells used in a phase by number of two-minute scans in the phase.

Another analysis used independent ratings of teachers. The Lincoln Head Start Director was asked to rate all of the teachers on level of implementation of the TEEM. The scale used was a Likert Form with 1 to 9 levels. The lowest teacher rated was a "2" and the two highest were "6's". Since these ratings were assigned independently of the variables examined for CAOS, one high-rated teacher was selected at

random from the two high rated teachers and was compared with the low rated teacher on the variable showing greatest variation on CACC in group data (in this case, the variable of inappropriate behavior).

For further examination of the data, activity categories were collapsed into five broad types of activities.

Type I consists of "traditional" academic activities and includes arithmetic, language, social studies and science.

Type II consists of cognitive learning activities for young children but not in the "traditional" sense. Included in this type are stories, games, puzzles, arts, crafts, cooking and building.

Type III consists of play and role playing.

Type IV consists of snacks (seldom used as there was deliberate attempt to avoid snack time during the observation period) and management. Management activities are generally those involved in managing the room. Examples might be: cleaning up, handing out materials, going after supplies (unless observer knows the related activity), sharpening pencils, teacher and child talking (child not waiting). These activities apply to both children and adults.

Type V consists of non-focused activities such as transitional activities, children out of the room, and wandering.

These five activity types were used to examine the proportion of time spent by adults and children in each activity type during Phases A and C combined, (when both were in the room together). These data were examined with Spearman Rho rank order correlation comparing the same high-rated classroom and low-rated classroom.

Findings

Due to the exploratory nature of the research and the small sample of classrooms, generous confidence limits were set for acceptance of statistically significant findings. The acceptable alpha level was set at .10. It was felt that this level would serve as sufficient indication that a variable should be explored in future research.

Table 1 shows the results of analysis of variance of each of the five summary variables. For each of the summary variables three sources of variance are reported. The first, group, refers to variance attributable to classroom style. The second, phase, refers to variance due to differences among the three twelve-minute observation phases. The third variance, group x phase, refers to interaction of classroom style and observation phase.

Analysis of the first summary variable, mean group size, indicated that differences among phases were significant ($p<.10$). There was no significant difference between classroom styles.

The most conspicuous differences appeared with the second summary variable, inappropriate behavior. Analysis of this variable indicated that significant differences existed in both independent variables, group and phase, as well as the interaction between these variables (group: $p<.10$; phase: $p<.001$; group by phase: $p<.05$).[1] Figure 5 gives graphic demonstration of the group-by-phase interaction.

Further analysis of this summary variable was conducted using the Newman-Keuls post hoc test. Since cell sizes were unequal the harmonic mean of cell n's was used as an estimate of n (Winer, 1962). To aid in discussion of the results of this analysis, following is a

Table 1

Comparison of TEEM x Comparison Classrooms across Phases for Selected CAOS Observation Summary Variables

Summary Variable	Source of Variance	df	MS	F
Mean Group Size	Group	1	.0057	.03
	Phase	2	.1700	3.81*
	Group x Phase	2	.0380	.85
Inappropriate Behavior	Group	1	193.3889	20.80**
	Phase	2	139.8750	14.36***
	Group x Phase	2	131.3472	13.48**
Mean Activity Size	Group	1	.2358	.06
	Phase	2	.7926	2.46
	Group x Phase	2	.2457	.76
Mean Number of Groups	Group	1	3.2939	2.34
	Phase	2	.0870	.06
	Group x Phase	2	1.2156	.81
Mean Number of Activities	Group	1	3.3153	1.61
	Phase	2	1.7060	2.54
	Group x Phase	2	.4335	.65

*p<.10.
**p<.05.
***p<.001

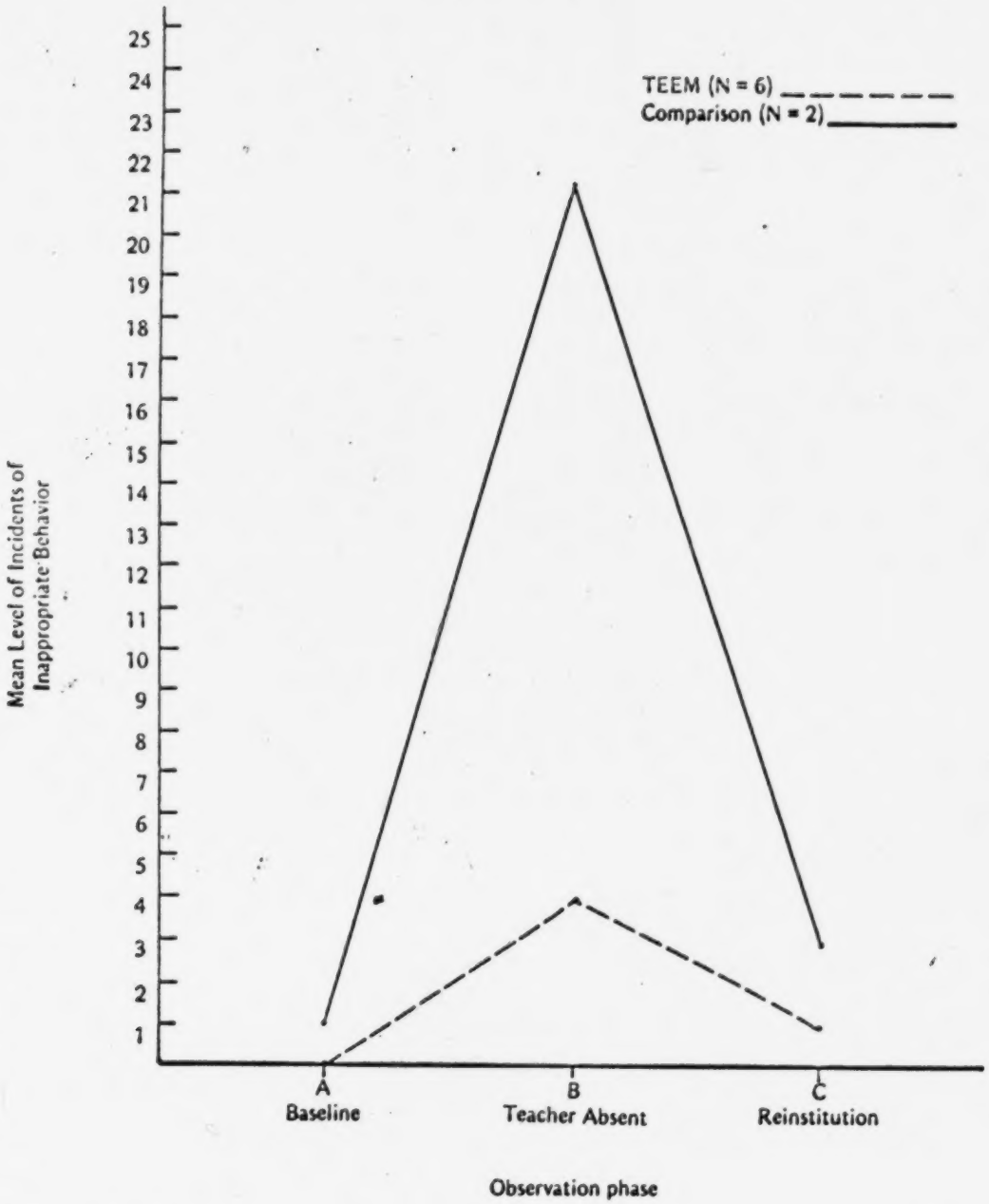

Figure 5. Incidents of Inappropriate Learning Behavior in TEEM and Comparison Classrooms across Observation Phases.

diagram of the analysis of variance design used for the summary variables. Cell means for inappropriate behavior are represented by the numbers in the diagram.

	Phase A	Phase B	Phase C
TEEM	1	2	3
Comparison	4	5	6

Fig. 6. Analysis of Variance Design.

Alpha level for this test was set at .05. Cell 5 (Teacher absent phase in Comparison classrooms) was significantly different from every other cell. No other significant differences were found.

No significant F-ratios were obtained for the other three summary variables tested, mean activity size, mean number of groups, and mean number of activities.

With only one classroom in the high-rated category and one in the low-rated category, no tests were conducted for statistical significance of the inappropriate behavior variables. However, a chart was prepared parallel to that for the summary variable, and the interaction pattern ran an essentially similar course (Figure 7).

When proportion of adult participation in each of the five activity types was compared to proportion of child participation in the same activity types during the same phases, rank order correlation between adult participation and child participation in the low rated classroom was -.27 (Figure 8). In the high rated classroom, the correlation between adult and child participation was .80 (Figure 9).

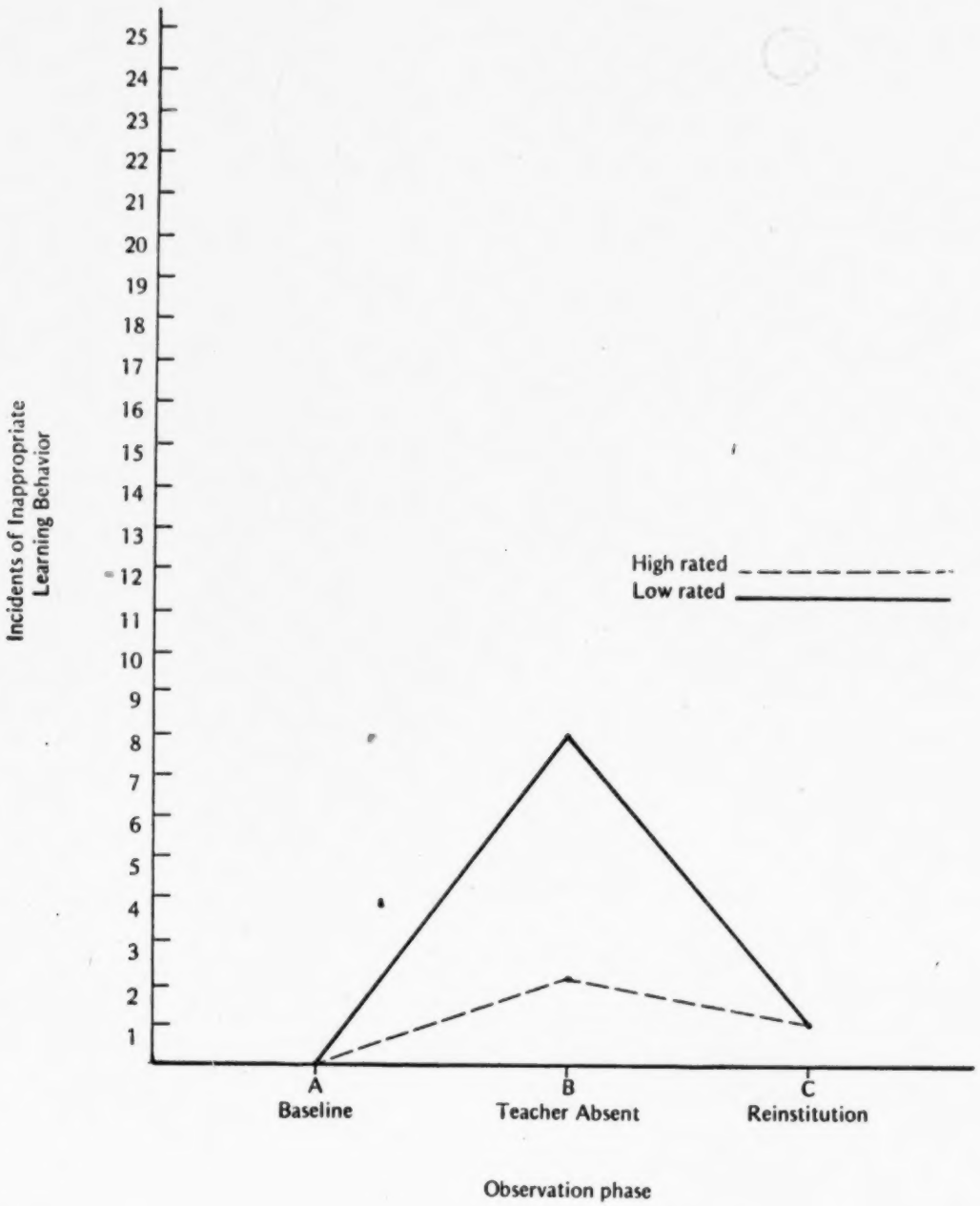

Figure 7. Incidents of Inappropriate Learning Behavior in a High and a Low Rated Classroom across Observation Phases.

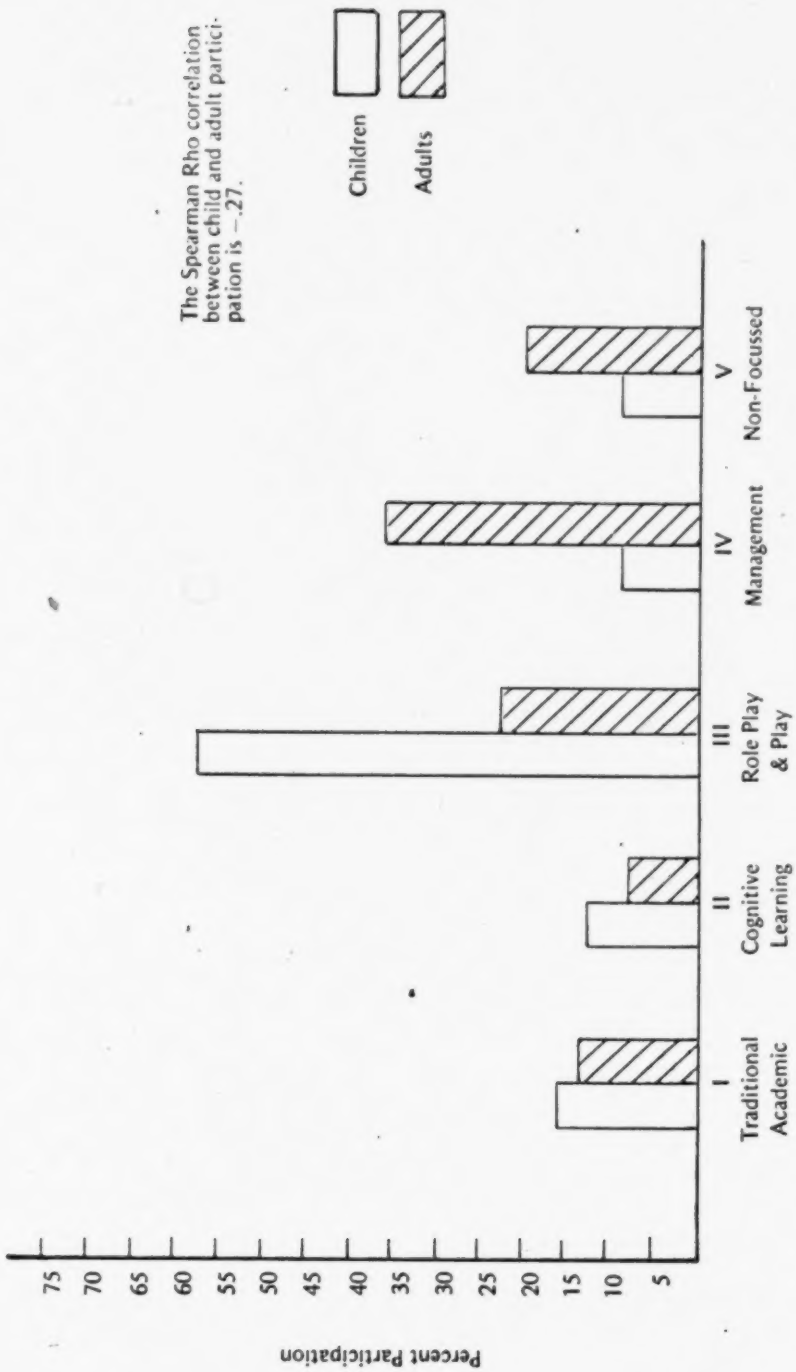

Figure 8. Location of Adults and Children by Activities in Low Rated Classroom.

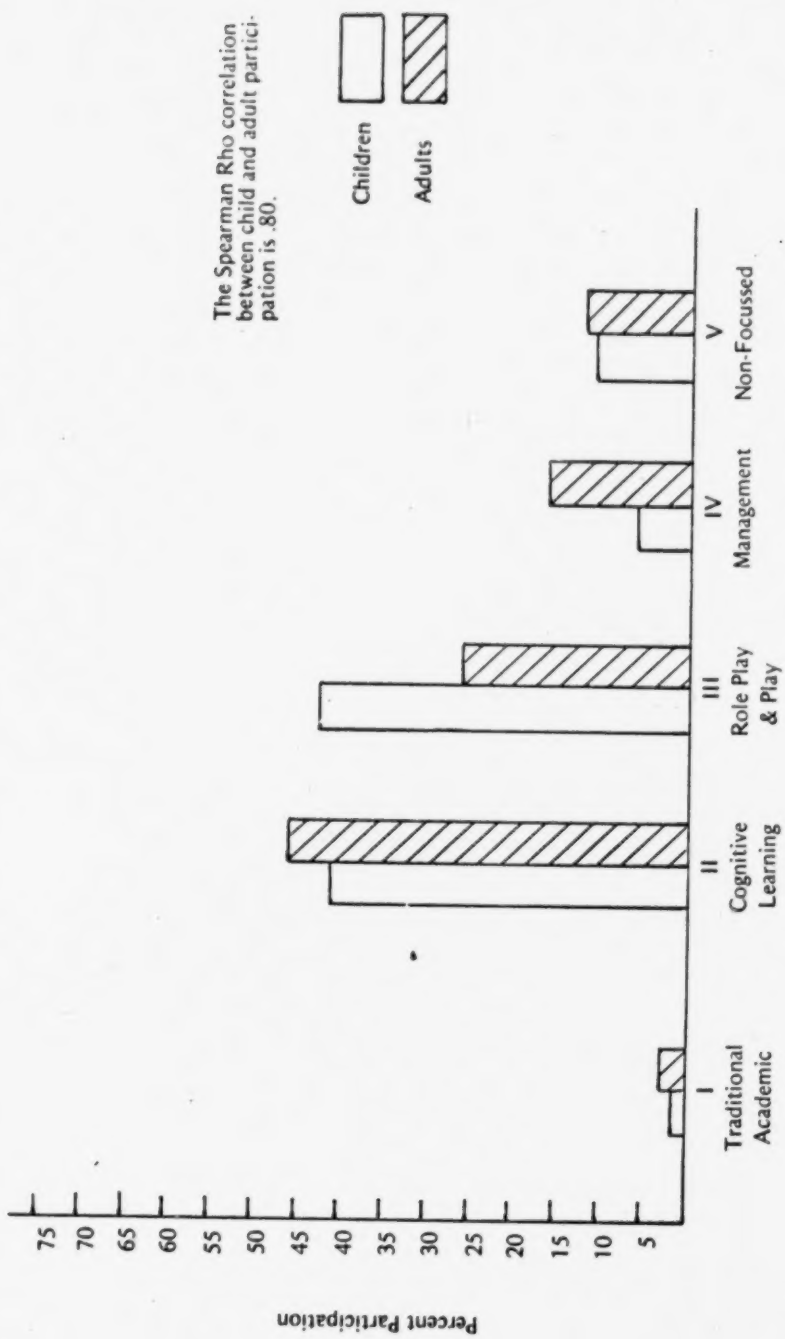

Figure 9. Location of Adults and Children by Activities in High Rated Classroom.

CHAPTER IV

CONCLUSIONS AND DISCUSSION

The Classroom Attitude Observation Schedule was developed for the purpose of assessing independent learning behavior of children in the open classroom setting. The Schedule was field tested to determine its sensitivity to differences in behavior when children were given the opportunity to be self-directing. That opportunity consisted of a period of time when none of the adults who normally manage the classroom was present.

Conclusions

The CAOS system is clearly sensitive to pattern shifts in some aspects of child behavior. The clearest pattern shift appeared with levels of inappropriate behavior. Children in the two comparison classrooms displayed more inappropriate behavior during the teacher absent phase than did the children in TEEM classrooms. The post hoc tests demonstrated no significant differences between level of inappropriate behavior in TEEM classrooms and Comparison classrooms during the teacher present phases. The differences between these two groups during teacher absent phase was significant ($p<.05$).

Within the TEEM classrooms, children in the classroom rated lowest by the Head Start Director displayed more inappropriate behavior during teacher absence than did children in the high-rated classroom. It also held true that there were significant differences between

teacher absent and teacher present phases in Comparison classrooms, while there were no significant differences between phases in TEEM classrooms. These comparisons also appeared to exist between the low-rated and the high-rated classroom.

The system picked up other indications of shifting patterns during teacher absence. One which was statistically significant was the area of mean group size. The size of groups in which children clustered themselves changed significantly when the teacher was not present. The difference demonstrated by this variable was significant when all eight classrooms were examined across phases. There were no significant differences between TEEM classrooms and Comparison classrooms on this variable, however. Analysis does not, of course, indicate direction of the change in group size, only that it grows larger or smaller when the teacher is not controlling it.

This conclusion should be approached with caution for several reasons. There is, in the Lincoln Head Start community, a fair amount of communication between teachers in TEEM classrooms and Comparison classrooms. Adaptations of the TEEM program to needs of very young children will probably also cause the two classroom types to look more alike at this level than at levels for older children. In addition, the classroom rated lowest of the eight was a TEEM classroom, even when all eight were rated by the Head Start Director on the same criteria.

The evidence is fairly conclusive that in some of these classrooms, particularly the Comparison and the low rated TEEM classroom, controls come largely from the teacher and not from controls internalized

by the children or that come from the activities themselves and the extent to which children find them satisfying.

In the room showing greatest difference in behavior patterns, adults appear to be controlling the socially appropriate behavior, group size, and activity choices. In an open classroom the choices and grouping patterns belong much more properly in the purview of the child.

While there are implications for further research into possible causes of the differences found with CAOS, one possible direction turned up serendipitously as a result of the CAOS data collection method. It was possible to compare the proportion of adult time spent in certain kinds of activities to the proportion of time children were spending in the same kinds of activities and at the same time. Figures 7 and 8 demonstrate such comparisons in the high rated and low rated classrooms. In the low rated classroom, correlation between adult and child participation in activity types was -.27. The same comparison made in the high rated classroom reaches a correlation of .80.

It appears that a classroom in which the children are best able to maintain a stable pattern of operation, whether or not adults are present, is the classroom in which adults spend their time interacting with children when they are both present in the classroom. A classroom in which the children do not maintain a stable pattern during teacher absence is a room in which the adults spend a large proportion of their time (37%) in management activities rather than interacting with children. While the adult-child ratio in these two rooms is not different, the quality of adult-child interaction clearly is different.

Problems and Concerns

Two concerns arose regarding possible recording errors as an artifact of the data collection method. The first arose from the possibility of children being missed in a two minute scan. As noted earlier, by requiring that the observer remain stationary during the entire observation period, it was possible to miss children who were obscured by block buildings, playhouse, and the like. It was felt at the outset that this was the price necessary to get at the overriding issue, behavior of children when they believe they are alone.

The second and related concern arose from the time required for a visual scan of the room. If a child moved quickly, it was entirely possible that he could be counted more than once in a scan.

In order to check data loss or gain a simple check was made. For each classroom, the mean number of children observed during a scan was calculated for each phase. When each classroom was plotted across phases, they essentially plotted straight, horizontal lines. There was one major exception. In one classroom, the mean number of children dropped by three during the teacher absent phase. The observer noted that children clustered so much at the doorway during the teacher's absence that it was difficult to count them. In the other seven classrooms, differences were so minor (amounting to less than 1 child in most cases) that the data were not considered seriously distorted by the recording conditions.

Another matter of concern should be noted regarding the particular data sample used for this study. On two occasions observation phases were cut short. On one occasion, the teacher returned to the room four minutes before completion of phase B. In another observation the

teacher called the children to the rug three minutes before the end of the final reinstitution phase. In all cases, summary data were calculated with reduced number of scans for the abbreviated phases.

Some concern was expressed by consultants to this project within the Arizona Center that the observer's presence in the classroom would exert the very control the experimenter was attempting to remove. Medley and Mitzel (1963) discuss this issue as a long-standing criticism of observation systems by many researchers. They say that such criticism is akin to the boy who turned out the light and tried to get to bed before it got dark. Medley and Mitzel (1963) believe that to gain information about students and teachers under observation seems better than knowing nothing about how they behave.

There was anecdotal evidence to suggest that the observer did not exert undue control in this experiment. A child, no more than three feet from an observer, exclaimed when the teacher and helpers left, "Oh boy, we're alone." In another classroom, when a piece of equipment malfunctioned during teacher absence, the observer was never even approached for assistance. Only other children were called upon. White and Lippitt (1960) reported the same sort of reaction (or lack of reaction) to observers. Their observers were most often ignored. When the leader left the room boys were likely to make remarks such as "Go ahead and do it; there isn't anybody here [p. 25]."

It must be noted, however, that in two instances, observers in the CAOS study were aware of brief behavior controls exerted by their presence in the classroom. In one instance, two boys started to wrestle in the playhouse and the observer accidentally permitted eye contact and

the wrestling stopped immediately. In another instance, it appeared to the observer that one child was about to hurt another and the observer made eye contact and shook her head slightly, which also brought the behavior to a stop. All that one can say is that there is no conclusive evidence to state that the observers did or did not exert undue control. Conclusions may still be drawn about the sensitivity of the observation procedure, since whatever control was exerted by the observer was indeed exerted in every classroom. At the same time, it seems imperative that this issue be tested at some time in the future. A search should be made for open classrooms with two-way mirrors for totally invisible observation. Then the experiment should be run two ways, with the observer present in the room, and with the observer completely hidden, in order to assess the amount of control exerted by the observer's presence in the room.

Implications for Future Research

Many questions need to be pursued in future research with larger samples. Many extensions of this research are foreseen. When consistent pattern shifts have been identified, indicating strong adult control as opposed to more internalized control on the part of children, factors relating to these patterns need to be sought. Evaluation designs are called for in which other classroom related variables will be correlated with the various patterns.

One such study anticipated for the near future will look for correlation between elements relating to levels of TEEM implementation and patterns emerging through use of CAOS. It may then be possible to

discover which particular elements of the TEEM correlate with self-direction on the part of children in the classroom.

Another aspect of future plans will involve searching for correlations between CAOS data and interaction data collected by Stanford Research Institute in the Five-Minute Observation portion of their Classroom Observation Procedure.

It is then planned that all such information should be funnelled back to the classroom teacher to assist her in efforts to move children to self-direction. A part of this may also be development of specific instrumentation for use by the classroom teacher.

Much of the research just mentioned is planned in at least four Follow Through sites during the year 1972-73. It is hoped that during this time, many of the questions raised during the early phases of this study may be resolved.

APPENDIX A

CAOS ACTIVITY CATEGORY DEFINITIONS

A. Snack; Lunch

Refers to any and all eating (unless cooking or preparing food experience is part of a structured activity). (If simple preparation for a snack, code under classroom management.)

B. 1) Group Time

Activities that require full group participation, such as morning opening activities, planning for the day or for a party, sharing ideas or items, resting after lunch, or watching television for entertainment. (This activity is normally not observed with CAOS.)

2) Story; Singing; Dancing; Music (any number of children)

Any number of children listening to records.
Helper or teacher reading story to children.
Putting records away.
Dancing.

C. 1) Arithmetic; Math; Numbers

Any activities that involve numbers; counting devices; measuring activities, etc. This could include an

abacus (even if child only appears to be idly moving beads across)
measuring chart on wall
number puzzles
number blocks
writing numbers on chalkboard
working with sets

2) Reading; Alphabet; Language Development

Any activity directed to the processes of teaching and learning language. This will include activities directed toward reading, writing or language development. Examples:

teacher or helper taking dictation
using typewriter (even if child only fiddling with keys)
writing letters on chalkboard
using language master
any puzzles or games associated with letters or word games (if you are able to make that distinction, such as word or letter bingo)

D. 1) Social Studies; Geography

Refers to the teaching and learning about people's life styles, culture patterns, and geography. An activity might be planning or responding to aspects of a field trip to the post office, a shopping center, a museum, etc. For geography, the children may be beginning mapping activities, charting the classroom, or mapping the school or neighborhood.

2) Science; Natural Study

Refers to teaching and learning about plants, animals, minerals (care of, collection, comparison) and science concepts. With very young children this may consist of:

playing with a classroom animal, such as a rabbit or gerbil
looking at fish in a tank
looking at objects through a microscope

Included in the science concepts would be the intellectual skills taught through a variety of means. This would include "intellectual kits" and activities dealing with shapes which are used for fostering observational skills, making comparisons, and a variety of discrimination skills.

E. Games; Puzzles

Guessing games, table games,puzzles, including tinker toys, card games, and jig saw puzzles.

F. 1) Arts; Crafts

Any art activity such as painting, collage, drawing, coloring (unless related to a language, math, or science activity), and crafts such as clay, stitchery, weaving, etc. If a child is drawing pictures on the chalkboard, it will also be coded here.

2) Sew; Cook; Pound; Saw

Cutting of fabric as well as sewing will be coded here. Cooking activities that are clearly part of a learning activity as opposed to a snack. Pounding and sawing will include any activities at a woodworking bench.

G. 1) Blocks; Trucks

This will include both small and large blocks.

2) Dolls; Dress Up; Playhouse

Any activity (other than snacks eaten in the playhouse), that involves dolls, doll house, tea party, dressing up, or other uses made of the playhouse area, such as barber shop or store. This category would also include play with puppets or any "acting out" situation.

H. Play

Any play, mobile or quiet, that is not clearly part of another activity but has the attention of the child and/or is apparently being enjoyed by the child. Examples might be play with small cars or a toy garage.

If a child is playing with material that seems very different from its intended purpose, code here. Examples might be a sword fight with tinker toy sticks, rolling phonograph records, spinning abacus beads.

I. Transitional Activities

Waiting kinds of activities. Moving through from one situation to another. Waiting to talk to a teacher or aide; waiting in line to get to an ongoing activity (such as the typewriter - unless involved with the child who is using the typewriter, such as advising or dictating). Other kinds of transitional activities: going to the bathroom, getting a drink of water, tying shoes, putting on coats, chilren in conversation with another when they are not obviously associated with another activity. (The last examples might be put in a category of a child's managing himself as opposed to managing the room.)

J. Classroom Management

Activities that involve managing the room (as opposed to an ongoing activity or one's self). If management kinds of actions take place within the boundaries of an ongoing activity as part of that activity, they should be coded with the activity. However, if, for instance, cleaning of paint brushes or washing pots and pans takes place some distance from the art or cooking activity then it is coded "management". If the observer cannot make this distinction easily, then going on a principle of coding into the higher level, code into the activity.

K. Out of Room

If children go out of the room and you cannot see the activity they are engaged in or do not know in some other way, code them here.

L. Observing; Other

This category is for any child who cannot be coded into an activity and seems only to be watching others or looking out the window (without an activity from which he may have momentarily diverted his attention).

The "Other" category is to be used if you find it impossible to code the child in any other reasonable place - then make note of what he is doing at the bottom of the code sheet.

M. Wandering

This category is a mobile parallel to the "L" category. Code child here if he appears to be wandering aimlessly, without having his attention focused on any activity or does not appear headed for any specific place. If he appears to have purpose, but you don't know what it is, code into "Classroom Management".

Generally, if two activities seem to overlap, attempt to code the activity that appears to dominate. If you are unable to do that, attempt to code for the first activity the child became engaged in. If all else fails, flip a coin.

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